

**NATIONAL COASTAL ASSESSMENT
2002**

**BENTHIC COMMUNITY CONDITION
IN MARYLAND'S COASTAL BAYS**

Prepared for

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FOREWORD

This document, *National Coastal Assessment 2002: Benthic Community Condition in Maryland's Coastal Bays*, was prepared by Versar, Inc., at the request of Ms. Cathy Wazniak of the Maryland Department of Natural Resources under Cooperative Agreement CA-07-4-30767-3734 between Versar, Inc., and the University of Maryland Center for Environmental and Estuarine Studies. The report assesses the status of benthic communities in the Maryland's coastal bays in support of the United States Environmental Protection Agency's National Coastal Assessment Program.

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1.0 INTRODUCTION

The National Coastal Assessment (NCA) Program, the continuation of the Coastal 2000 Project, is a component of the Environmental Monitoring and Assessment Program (EMAP). The National Coastal Assessment and EMAP are national research programs led by the Environmental Protection Agency's Office of Research and Development (EPA-ORD). The New NCA/EMAP are intended to develop the scientific tools and agency partnerships needed to broadly assess the status and trends of significant ecological systems. The goal of EMAP is to "monitor the condition of the Nation's ecological resources to evaluate the cumulative success of current policies and programs and to identify emerging problems before they become widespread or irreversible."

The Maryland Department of Natural Resources (DNR) has developed a Cooperative Agreement with the Environmental Protection Agency (EPA) to join collaboratively in the National Coastal Assessment Program to assess the coastal waters and estuaries of the United States. As the lead agency for the state of Maryland, DNR conducted a study in August 2002 to assess water quality, sediment quality, and the quality of biological resources in the Maryland's coastal bays. This document presents the results of the benthic portion of the study (i.e., an assessment of the bottom invertebrate community).

2.0 METHODS

2.1 SAMPLE COLLECTION

Benthic samples for NCA 2002 were collected at 124 sites between 31 July and 15 August 2002. One hundred nine sites were National Coastal Assessment water quality monitoring sites, 4 sites were Environmental Monitoring and Assessment Program (EMAP) sites, and 11 sites were Mid-Atlantic Integrated Assessment (MAIA) sites (Figure 1). Station designation and location are presented in Table 1.

Standardized methods were used in this project. While the field and laboratory procedures were consistent with the methods used by the NCA partners, an effort was made to obtain data that could be compared with historic and current monitoring efforts in Maryland's estuarine waters.

Benthic samples were collected with a Young Grab, which samples an area of 440 cm² to a depth of 10 cm. Three benthic grab samples were collected at each site. All samples were sieved through a 0.5-mm screen using an elutriative process, and the organisms retained on the screen were transferred to labeled jars and preserved in 10% buffered formalin stained with Rose Bengal (a vital stain used to aid separation of organisms from sediment and detritus). One sediment subsample for silt-clay analysis and three sediment subsamples for chlorophyll *a* analysis were collected from an additional

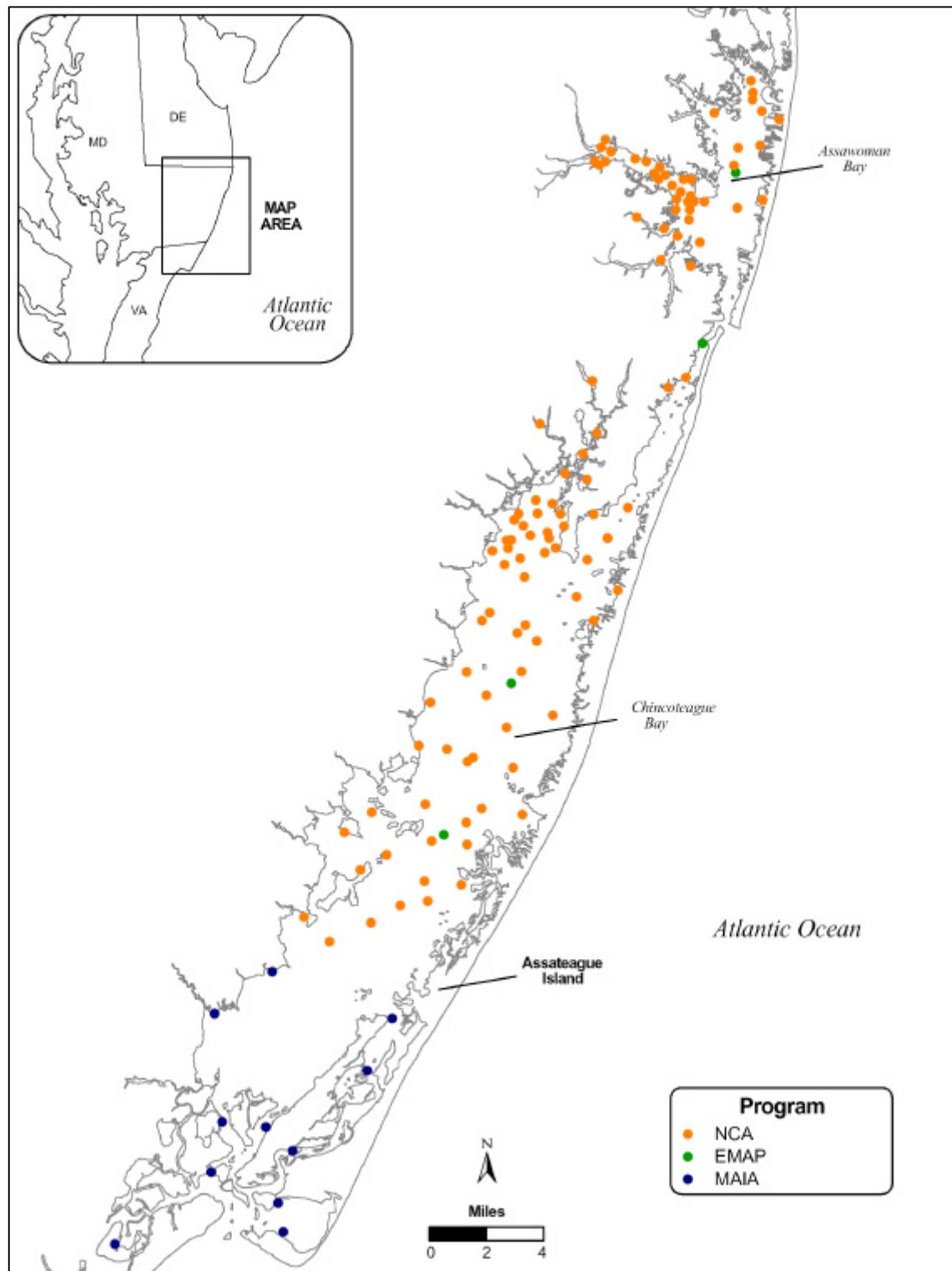


Figure 1. Location of the coastal bays sampling sites for 2002

grab sample from each site. For sediment chlorophyll, a small sample (approximately 5 cm²) from the top one centimeter of sediment was scooped into a 60 cm³ syringe and kept on ice in the dark while on board. Chlorophyll and silt-clay analysis samples were subsequently frozen until processed in the laboratory.

Water quality measurements included surface and bottom water temperature, conductivity, salinity, dissolved oxygen concentration (DO), and pH, and surface Photosynthetically Active Radiation (PAR) and chlorophyll. The first five parameters were recorded electronically at 0.5 m from the surface and 0.5 m from the bottom using a YSI 6600 Sonde and a 650 data logger. PAR was measured immediately below the surface of the water column and every 0.5 m thereafter using a LI-192SA Underwater Quantum Sensor and a LI-190SA Reference Sensor (LI-COR Corporation, Lincoln, Nebraska). Samples for water-column chlorophyll *a* were collected in duplicate for each site by filtering a 1-L volume of surface water onto 47-mm diameter GFF filters using a vacuum filtration system. Filters were kept on ice in the dark while on board and later frozen pending analysis.

2.2 LABORATORY PROCESSING

Organisms from one replicate benthic sample were sorted from detritus under dissecting microscopes, identified to the lowest practical taxonomic level, and counted. The other two replicate benthic samples were re-screened in the lab, transferred to ethanol, and archived. High-salinity oligochaetes were identified to group level only.

A voucher collection of rare and taxonomically problematic species initiated with the Coastal 2000 assessment is available upon request. Rare species are those for which there were no specimens, or only one specimen existed, in the permanent reference collections maintained at Versar or Cove Corporation. Taxonomically problematic species are those for which there was insufficient taxonomic information to resolve their classification with certainty.

Sand and silt-clay particles were separated by wet-sieving through a 63 micron stainless steel sieve and weighed using standard procedures described in Plumb (1981) and Buchanan (1984). Chlorophyll *a* analysis were conducted by the Chesapeake Biological Laboratory (CBL) following standard methods described in Strickland and Parsons (1972).

2.3 DATA ANALYSIS

Analyses were performed in the context of measures of benthic community condition used in a benthic index of biotic integrity (B-IBI) developed for the U.S. EPA Mid-Atlantic Integrated Assessment (MAIA) Program (Llansó et al. 2002). The MAIA region extends from the Delaware Bay estuary to Pamlico Sound. The MAIA B-IBI is a multiple-attribute index designed to identify the degree to which a benthic assemblage deviates from expected reference (non-degraded) conditions. It integrates several benthic

community attributes indicative of "health" into a single number that measures overall benthic community condition.

The MAIA index was derived following procedures similar to those used during the development of the Chesapeake Bay B-IBI (Weisberg et al., 1997). Thresholds were established for each of several attributes as the 10th (or 90th, see below) and the 50th percentile values of the distribution of values at reference sites. This was done for each of five salinity habitats. For each attribute, a value from a new sample falling below the 10th percentile threshold (or above the 90th) was considered to deviate strongly from values at the best reference sites in similar habitats. An upper threshold corresponding to the 90th percentile was used for some attributes (e.g., percent abundance as pollution indicative taxa) because the direction of the response is such that higher percentages are expected in degraded sites than in reference sites. The index was validated using an independent data set. Existing datasets from several federal and state sampling programs and multiple years were used to develop and validate the index. For details see Llansó et al. (2002).

Attributes of benthic community condition used in the MAIA index were: abundance (number of individuals per m²), number of taxa, Shannon-Wiener diversity index (calculated with logarithms in base 2), percent dominance (100 minus the percent abundance contributed by the top two numerically dominant taxa), percent abundance as pollution indicative taxa, percent abundance as pollution sensitive taxa, percent abundance of deep-deposit feeders, percent abundance of Bivalvia, and the percent abundance ratio of Tanypodinae to Chironomidae. Epifaunal organisms, which usually respond differently to pollution than infauna (Ranasinghe et al. 1994), were eliminated from the analysis.

One of the measures listed above, abundance, responds bimodally to stress; that is, the response can be greater than at reference sites with moderate degrees of stress, and less than at reference sites with high degrees of stress (Pearson and Rosenberg 1978). For this measure, an upper threshold corresponding to the 90th percentile value at reference sites was established in addition to the lower threshold corresponding to the 10th percentile (Weisberg et al., 1997). Values from samples falling above the upper threshold indicate moderate effects on benthos resulting in excess abundance in relation to organic enrichment. Values from samples falling below the lower threshold indicate depauperate benthic communities symptomatic of prolonged oxygen stress, toxic contamination, or other anthropogenic disturbance.

As with the Chesapeake Bay B-IBI, the MAIA index is scaled from 1 to 5. Sites with values of 3 or more were considered to meet the goal, defined here as the observation of a benthic community that does not differ significantly from the reference (non-degraded) condition. Based on the MAIA B-IBI, sites were classified into three levels. Sites with index values less than or equal to 2.0 were classified as severely degraded; sites with index values from 2.1 to 2.9 were classified as degraded; and sites with index values of 3.0 or more were classified as meeting the goal.

3.0 RESULTS

For each of the 124 NCA 2002 sites, MAIA B-IBI values are presented in Table 2 and the corresponding benthic community condition is presented in Figure 2. Station specific water quality measurements and sediment composition are provided in Table 3. A complete list of species and their abundance is provided in the Appendix. Due to an electrical problem with the YSI communication cable, YSI water quality data at 15 sites were collected 2 days later than all the other sampling data. Initial sampling in Newport Bay was conducted on 7 August 2002 at sites 059-064, 066-072, and 074 and 075; water quality data was measured on 9 August 2002.

Chlorophyll *a* concentrations of sediments and water and PAR values are provided in electronic format separately from this report. The PAR sensor failed during the final days of fieldwork. In total, PAR was not measured at 18 sites. Sediment chlorophyll analysis was conducted for three replicates per site. Water chlorophyll analysis was conducted on two replicates for 10% of the sites, and on single samples for the remaining of the sites. Sediment chlorophyll estimates were calculated using an area of 0.491 cm² corresponding to the area of the syringe used to collect the samples. The calculations are designed for a 1 cm³ sediment core; however, many of the samples had more than one cubic centimeter of sediment. These samples have been qualified. Excess sediment creates an underestimation of chlorophyll within the sediment because the top centimeter is diluted with the lower layers which have less active chlorophyll and more phaeopigments to interfere. Comparisons of these samples with 1 cm³ cores should be avoided.

The data presented in Table 2 include two modifications this year. First, percent dominance is presented as the percent abundance contributed by the top two numerically dominant taxa. In previous years, percent dominance was presented as 100 minus the percent abundance contributed by the top two numerically dominant taxa. This last value is the value used to score the metric in the MAIA B-IBI. We preferred to show straight percentages of dominant taxa in this report. Note that this metric is not used to score polyhaline sites. In the 2002 assessment, all sites were polyhaline. Second, the abundance of two taxa, *Mediomastus* spp. and *Mediomastus ambiseta*, were combined this year to calculate Shannon diversity, percent dominance, and percent abundance as pollution sensitive taxa. Densities of *M. ambiseta* were very high in 2002. Many individuals could not be identified to the species level because the posterior end of the worm fragments easily and this portion is needed in the identification. However, *M. ambiseta* is usually much more abundant in the coastal bays of Maryland than *M. californiensis*, the other co-occurring species. There is a high probability that the individuals identified only as *Medimastus* spp. are indeed *M. ambiseta*. For this reason, and to capture in the metrics the large numbers of individuals identified to the genus level in the samples, we decided to combine these two taxa. A word of caution should be issued, though, because we do not know exactly how abundant *M. californiensis* is. Index scores were only slightly affected by this treatment because Shannon diversity was the least of the affected metrics and the only one to contribute to the polyhaline B-IBI.

Of the 124 sites sampled in 2002, 95 sites (77%) exhibited healthy benthic communities (index score equal to or greater than 3.0) and 29 (23%) exhibited degraded benthos (index score < 3.0, Table 2, Figure 2). Of the 29 sites that failed, 18 were classified as severely degraded and 11 were classified as degraded by the index.

Degradation at sites 006, 009, 011-018, 036, 041, and 046 was due to low abundance or low abundance in combination with dominance by 1-2 species, usually the polychaetes *Streblospio benedicti* and *M. ambiseta*. Most of these sites were located in the upper reaches of creeks and in the St. Martin River. Degradation in the remaining of the sites was due to strong dominance, often with overabundance or organisms relative to reference conditions. The polychaetes *S. benedicti* and *M. ambiseta*, and the Oligochaeta often accounted for the majority of organisms in these samples. Occasionally, the amphipod *Ampelisca abdita*, and *Capitella capitata*, *Exogone dispar*, and other small polychaetes accounted for a large proportion of organisms in the sample. However, the large densities of *A. abdita* observed during August 2001 did not occur in 2002. Excess abundance (causing the abundance metric to score as 1) occurred at 27 sites (22% of all sites).

Excess abundance of organisms is often attributed to organic enrichment of the sediment and has been linked to excess algal growth and nutrient over enrichment in some studies. Natural contributions of detritus from marshes may also contribute to excess abundance of organisms. This may be a major factor structuring benthic communities in Chincoteague Bay. We observed large amounts of detritus in samples collected near the periphery of marshes in Chincoteague Bay. Low dissolved oxygen did not appear to be a problem in the Maryland coastal bays. The analysis and interpretation of the chlorophyll samples will be able to help assess eutrophic conditions in the bays.

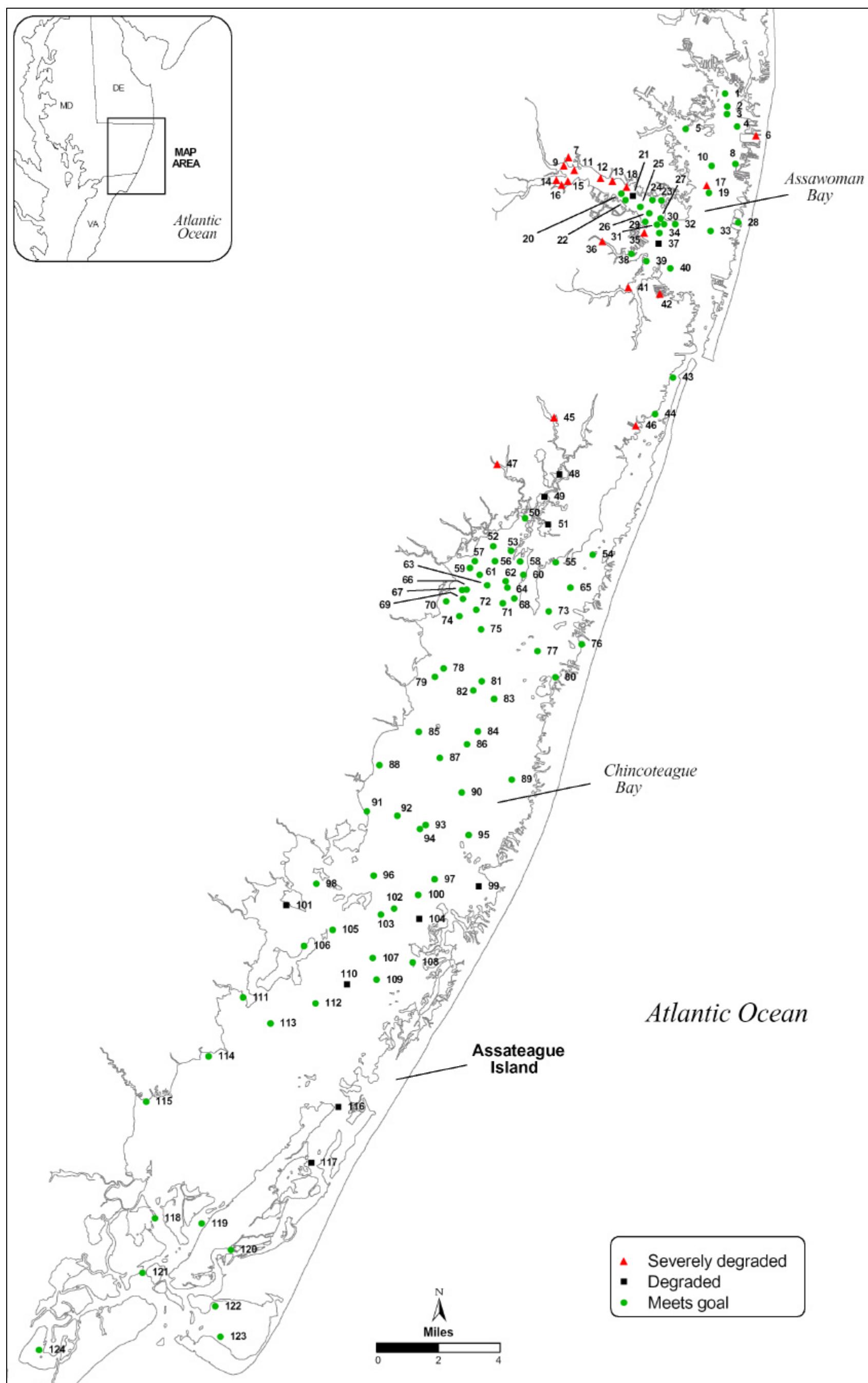


Figure 2. Benthic Community condition at each of the August 2002 Coastal Bays sites

Table 1. Coastal bays sampling sites for 2002

Program	Station (this report)	Station (DNR)	Latitude	Longitude
National Coastal Assessment	MDCB-001	506	38° 26.8176	75° 4.7263
	MDCB-002	505	38° 26.4659	75° 4.6431
	MDCB-003	603	38° 26.2567	75° 4.6581
	MDCB-004	553	38° 25.9066	75° 4.2956
	MDCB-005	507	38° 25.8519	75° 6.1300
	MDCB-006	604	38° 25.6632	75° 3.6216
	MDCB-007	616	38° 25.0706	75° 10.3142
	MDCB-008	549	38° 24.8815	75° 4.3629
	MDCB-009	706	38° 24.8301	75° 10.4787
	MDCB-010	550	38° 24.8210	75° 5.2075
	MDCB-011	221	38° 24.7069	75° 10.1015
	MDCB-012	219	38° 24.4862	75° 9.1707
	MDCB-013	217	38° 24.4169	75° 8.7408
	MDCB-014	223	38° 24.4318	75° 10.7438
	MDCB-015	715	38° 24.4190	75° 10.3292
	MDCB-016	224	38° 24.3037	75° 10.5560
	MDCB-017	503	38° 24.2919	75° 5.3759
	MDCB-018	215	38° 24.2459	75° 8.2324
	MDCB-020	218	38° 24.0614	75° 8.4366
	MDCB-021	216	38° 24.0049	75° 8.0205
	MDCB-022	228	38° 23.8917	75° 8.2738
	MDCB-023	211	38° 23.8752	75° 7.0014
	MDCB-024	212	38° 23.8857	75° 7.3221
	MDCB-025	202	38° 23.6968	75° 7.7517
	MDCB-026	203	38° 23.5123	75° 7.4295
	MDCB-027	213	38° 23.3822	75° 7.0344
	MDCB-028	628	38° 23.2681	75° 4.2585
	MDCB-029	205	38° 23.2891	75° 7.5750
	MDCB-030	227	38° 23.2240	75° 6.9117
	MDCB-031	204	38° 23.2137	75° 7.1500
	MDCB-032	214	38° 23.2187	75° 6.5082
	MDCB-033	504	38° 23.0322	75° 5.2452
	MDCB-034	206	38° 22.9738	75° 7.0705
	MDCB-035	226	38° 22.9812	75° 7.6079
	MDCB-036	210	38° 22.7530	75° 9.1080
	MDCB-037	207	38° 22.6756	75° 7.0981
	MDCB-038	620	38° 22.4107	75° 8.0720
	MDCB-039	201	38° 22.1973	75° 7.5379
	MDCB-040	501	38° 22.0112	75° 6.6826
	MDCB-041	502	38° 21.4732	75° 8.1773

Table 1. (Continued)

Program	Station (this report)	Station (DNR)	Latitude		Longitude	
National Coastal Assessment (Continued)	MDCB-042	623	38°	21.3028	75°	7.0463
	MDCB-044	508	38°	17.9856	75°	7.2217
	MDCB-045	707	38°	17.8860	75°	10.8280
	MDCB-046	614	38°	17.6768	75°	7.9120
	MDCB-047	315	38°	16.6070	75°	12.8550
	MDCB-048	301	38°	16.3260	75°	10.643
	MDCB-049	313	38°	15.7150	75°	11.1810
	MDCB-050	314	38°	15.1133	75°	11.8690
	MDCB-051	316	38°	14.9502	75°	11.0404
	MDCB-052	306	38°	14.3401	75°	13.0072
	MDCB-053	305	38°	14.2236	75°	12.3695
	MDCB-054	509	38°	14.1134	75°	9.4590
	MDCB-055	611	38°	13.9038	75°	10.7792
	MDCB-056	303	38°	13.9398	75°	12.9382
	MDCB-057	304	38°	13.9340	75°	13.6640
	MDCB-058	317	38°	13.9258	75°	12.0452
	MDCB-059	312	38°	13.7437	75°	13.8348
	MDCB-060	307	38°	13.5599	75°	11.9299
	MDCB-061	309	38°	13.5617	75°	13.4852
	MDCB-062	308	38°	13.3802	75°	12.5587
	MDCB-063	310	38°	13.2724	75°	13.2159
	MDCB-064	318	38°	13.2021	75°	12.5013
	MDCB-065	521	38°	13.2021	75°	10.2450
	MDCB-066	311	38°	13.1485	75°	13.9478
	MDCB-067	322	38°	13.1400	75°	14.1204
	MDCB-068	319	38°	12.9107	75°	12.2479
	MDCB-069	323	38°	12.9006	75°	14.0828
	MDCB-070	324	38°	12.8291	75°	14.6842
	MDCB-071	320	38°	12.7713	75°	12.6625
	MDCB-072	325	38°	12.6005	75°	13.6067
	MDCB-073	522	38°	12.5532	75°	11.0210
	MDCB-074	321	38°	12.4189	75°	14.2095
	MDCB-075	524	38°	12.0567	75°	13.4403
	MDCB-076	526	38°	11.6500	75°	9.8480
	MDCB-077	523	38°	11.4560	75°	11.4243
	MDCB-078	525	38°	10.9813	75°	14.7777
	MDCB-079	513	38°	10.7468	75°	15.0821
	MDCB-080	527	38°	10.7380	75°	10.7850
	MDCB-081	515	38°	10.6214	75°	13.4116
	MDCB-082	517	38°	10.3787	75°	13.7142

Table 1. (Continued)

Program	Station (this report)	Station (DNR)	Latitude		Longitude	
National Coastal Assessment (Continued)	MDCB-083	516	38°	10.1408	75°	12.9753
	MDCB-084	510	38°	9.2411	75°	13.5489
	MDCB-085	514	38°	9.2329	75°	15.659
	MDCB-087	512	38°	8.5202	75°	14.9057
	MDCB-088	551	38°	8.3202	75°	17.0629
	MDCB-089	714	38°	7.9235	75°	12.3407
	MDCB-090	708	38°	7.5608	75°	14.1289
	MDCB-091	541	38°	7.0348	75°	17.5132
	MDCB-092	537	38°	6.9250	75°	16.4221
	MDCB-093	554	38°	6.6637	75°	15.4200
	MDCB-094	536	38°	6.5575	75°	15.6258
	MDCB-095	555	38°	6.3814	75°	13.8789
	MDCB-096	712	38°	5.2776	75°	17.2704
	MDCB-097	520	38°	5.1679	75°	15.0929
	MDCB-098	543	38°	5.0442	75°	19.3146
	MDCB-099	709	38°	4.9760	75°	13.5169
	MDCB-100	531	38°	4.7416	75°	15.6796
	MDCB-101	545	38°	4.4521	75°	20.3823
	MDCB-103	533	38°	4.1993	75°	17.0186
	MDCB-104	532	38°	4.0767	75°	15.6390
	MDCB-105	711	38°	3.7760	75°	18.7411
	MDCB-106	548	38°	3.3407	75°	19.7541
	MDCB-107	538	38°	3.0006	75°	17.2986
	MDCB-108	530	38°	2.8832	75°	15.8789
	MDCB-109	713	38°	2.4029	75°	17.1657
	MDCB-110	540	38°	2.2821	75°	18.2218
	MDCB-111	547	38°	1.9171	75°	21.9336
	MDCB-112	552	38°	1.7543	75°	19.3488
	MDCB-113	710	38°	1.1915	75°	20.9584
EMAP	MDCB-019	VA92-495	38°	24.0849	75°	5.3071
	MDCB-043	VA93-641	38°	18.9996	75°	6.5860
	MDCB-086	VA93-634	38°	8.8834	75°	13.9432
	MDCB-102	VA90-034	38°	4.3688	75°	16.5439
MAIA	MDCB-114	MAIA-09	38°	0.2980	75°	23.1603
	MDCB-115	MAIA-10	37°	59.0468	75°	25.3871
	MDCB-116	MAIA-08	37°	58.9020	75°	18.5330
	MDCB-117	MAIA-52	37°	57.3599	75°	19.4936
	MDCB-118	MAIA-49	37°	55.8301	75°	25.0819
	MDCB-119	MAIA-11	37°	55.6816	75°	23.4094
	MDCB-120	MAIA-12	37°	54.9536	75°	22.3681

Table 1. (Continued)

Program	Station (this report)	Station (DNR)	Latitude		Longitude	
MAIA (Continued)	MDCB-121	MAIA-51	37°	54.3293	75°	25.5188
	MDCB-122	MAIA-13	37°	53.4036	75°	22.9266
	MDCB-123	MAIA-50	37°	52.5628	75°	22.7412
	MDCB-124	MAIA-48	37°	52.1999	75°	29.2132

Table 2. MAIA B-IBI metric values and index scores. Blanks indicate metrics not applicable to the salinity habitat in which the station was classified, or correspond to measures for which percentages cannot be calculated. Salinity class definition: Poly = polyhaline (> 18 psu).

Station	Abundance (#/m ²)	Shannon -Wiener	No. Taxa (#/0.044 m ²)	% Dominance	% Pollution Indicative	% Pollution Sensitive	% Tany/Chiron	% Bivalve Abundance	% Deep Feeding	Abun Score	Shan Score	Taxa score	Domi Score	Pollu-ind Score	Pollu-sen Score	Tany Score	Bival Score	Deep Score	MAIA Index	Salinity Class
MDCB-001	2818.2	3.29	18	41.94	4.84	55.65	.	4.03	75.00	5	5	3	.	.	.	.	3	.	4.0	Poly
MDCB-002	3954.5	2.99	15	49.43	9.77	32.76	.	0.57	66.09	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-003	3886.4	2.86	18	56.73	2.34	75.44	.	0.58	78.95	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-004	1431.8	2.81	13	55.56	14.29	76.19	.	4.76	19.05	3	3	3	.	.	.	.	3	.	3.0	Poly
MDCB-005	6772.7	3.67	35	48.32	8.39	40.60	.	7.72	29.19	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-006	204.5	2.28	6	55.56	44.44	22.22	.	0.00	22.22	1	3	1	.	.	.	.	1	.	1.5	Poly
MDCB-007	1477.3	1.18	4	96.92	43.08	0.00	.	0.00	56.92	5	1	1	.	.	.	.	1	.	2.0	Poly
MDCB-008	1931.8	3.25	17	47.06	32.94	35.29	.	4.71	14.12	5	5	3	.	.	.	.	3	.	4.0	Poly
MDCB-009	181.8	0.54	2	100	87.50	0.00	.	0.00	0.00	1	1	1	.	.	.	.	1	.	1.0	Poly
MDCB-010	1068.2	2.35	10	63.83	4.26	89.36	.	8.51	53.19	3	3	3	.	.	.	.	5	.	3.5	Poly
MDCB-011	863.6	0.18	2	100	97.37	0.00	.	0.00	2.63	3	1	1	.	.	.	.	1	.	1.5	Poly
MDCB-012	181.8	2.25	5	50.00	50.00	37.50	.	0.00	37.50	1	3	1	.	.	.	.	1	.	1.5	Poly
MDCB-013	954.5	0.77	4	95.24	85.71	11.90	.	0.00	9.52	3	1	1	.	.	.	.	1	.	1.5	Poly
MDCB-014	386.4	0.67	2	100	17.65	82.35	.	0.00	82.35	1	1	1	.	.	.	.	1	.	1.0	Poly
MDCB-015	431.8	0.91	3	94.74	15.79	78.95	.	0.00	84.21	1	1	1	.	.	.	.	1	.	1.0	Poly
MDCB-016	522.7	0.89	2	100	69.57	30.43	.	0.00	30.43	1	1	1	.	.	.	.	1	.	1.0	Poly
MDCB-017	7204.5	1.87	18	77.92	2.52	78.55	.	0.00	82.65	3	1	3	.	.	.	.	1	.	2.0	Poly
MDCB-018	204.5	2.42	6	55.56	44.44	11.11	.	0.00	11.11	1	3	1	.	.	.	.	1	.	1.5	Poly
MDCB-019	3227.3	2.71	22	64.79	2.11	72.54	.	0.70	66.90	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-020	1295.5	3.11	13	43.86	7.02	29.82	.	0.00	50.88	3	5	3	.	.	.	.	1	.	3.0	Poly
MDCB-021	1340.9	2.39	10	69.49	1.69	11.86	.	0.00	59.32	3	3	3	.	.	.	.	1	.	2.5	Poly
MDCB-022	2136.4	3.25	18	50.00	11.70	54.26	.	5.32	45.74	5	5	3	.	.	.	.	3	.	4.0	Poly
MDCB-023	5795.4	2.69	22	64.71	28.24	42.75	.	0.78	59.22	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-024	9431.8	2.63	32	70.60	15.90	63.61	.	0.96	62.17	1	3	5	.	.	.	.	3	.	3.0	Poly
MDCB-025	1568.2	2.70	13	59.42	11.59	60.87	.	0.00	49.28	5	3	3	.	.	.	.	1	.	3.0	Poly
MDCB-026	3250.0	1.84	14	81.82	4.20	72.73	.	0.70	69.93	5	1	3	.	.	.	.	3	.	3.0	Poly
MDCB-027	2045.4	3.30	18	43.33	25.56	47.78	.	0.00	41.11	5	5	3	.	.	.	.	1	.	3.5	Poly
MDCB-028	1886.4	2.37	9	66.27	39.76	0.00	.	0.00	45.78	5	3	3	.	.	.	.	1	.	3.0	Poly
MDCB-029	11272.7	3.49	37	44.96	14.72	34.27	.	2.22	47.58	1	5	5	.	.	.	.	3	.	3.5	Poly
MDCB-030	7363.6	2.28	24	75.31	5.25	67.59	.	1.54	79.32	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-031	4795.4	2.81	22	62.09	8.53	68.25	.	1.90	61.14	5	3	5	.	.	.	.	3	.	4.0	Poly

Table 2. (Continued)

Station	Abundance (#/m ²)	Shannon -Wiener	No. Taxa (#/ 0.044 m ²)	% Domi- nance	% Pollution Indicative	% Pollution Sensitive	% Tany/ Chiron	% Bivalve Abundance	% Deep Feeding	Abun- Score	Shan- Score	Taxa score	Domi- Score	Pollu- ind Score	Poll- sen Score	Tany Score	Bival- Score	Deep Score	MAIA Index	Salinity Class
MDCB-032	1954.5	1.98	11	75.58	12.79	76.74	.	2.33	69.77	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-033	1227.3	3.28	14	40.74	7.41	62.96	.	9.26	38.89	3	5	3	.	.	.	.	5	.	4.0	Poly
MDCB-034	4931.8	2.86	28	60.83	6.45	69.12	.	3.23	68.66	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-035	1545.4	0.41	4	97.06	95.59	2.94	.	0.00	4.41	5	1	1	.	.	.	.	1	.	2.0	Poly
MDCB-036	659.1	0.00	1	100	100.00	0.00	.	0.00	0.00	3	1	1	.	.	.	.	1	.	1.5	Poly
MDCB-037	9136.3	1.96	29	79.35	7.96	77.61	.	0.75	78.36	1	1	5	.	.	.	.	3	.	2.5	Poly
MDCB-038	2477.3	1.64	11	83.49	83.49	1.83	.	0.92	7.34	5	1	3	.	.	.	.	3	.	3.0	Poly
MDCB-039	4340.9	2.84	22	60.21	27.75	38.74	.	1.57	56.54	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-040	6295.4	2.52	25	68.59	7.22	69.31	.	2.17	74.37	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-041	568.2	1.92	8	72.00	64.00	20.00	.	0.00	20.00	1	1	3	.	.	.	.	1	.	1.5	Poly
MDCB-042	1477.3	0.96	3	98.46	27.69	0.00	.	0.00	72.31	5	1	1	.	.	.	.	1	.	2.0	Poly
MDCB-043	1318.2	2.60	11	60.34	1.72	48.28	.	37.93	3.45	3	3	3	.	.	.	.	5	.	3.5	Poly
MDCB-044	9954.5	2.66	34	72.15	0.68	60.50	.	7.53	74.66	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-045	1750.0	0.84	3	94.81	0.00	0.00	.	0.00	81.82	5	1	1	.	.	.	.	1	.	2.0	Poly
MDCB-046	363.6	2.08	6	68.75	50.00	6.25	.	0.00	31.25	1	3	1	.	.	.	.	1	.	1.5	Poly
MDCB-047	4636.3	0.40	3	99.02	0.98	0.00	.	0.00	99.02	5	1	1	.	.	.	.	1	.	2.0	Poly
MDCB-048	2750.0	1.10	7	88.43	81.82	3.31	.	0.00	16.53	5	1	3	.	.	.	.	1	.	2.5	Poly
MDCB-049	2090.9	1.71	7	85.87	43.48	52.17	.	0.00	42.39	5	1	3	.	.	.	.	1	.	2.5	Poly
MDCB-050	3840.9	3.36	23	46.15	12.43	43.79	.	0.59	42.60	5	5	5	.	.	.	.	3	.	4.5	Poly
MDCB-051	3886.4	1.71	14	81.87	71.35	14.62	.	0.00	16.37	5	1	3	.	.	.	.	1	.	2.5	Poly
MDCB-052	4977.3	2.92	28	61.19	1.37	68.49	.	1.83	64.84	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-053	11136.3	3.17	31	59.18	7.76	53.47	.	10.20	63.67	1	5	5	.	.	.	.	5	.	4.0	Poly
MDCB-054	13409.0	4.04	31	26.27	1.36	14.92	.	2.54	31.36	1	5	5	.	.	.	.	3	.	3.5	Poly
MDCB-055	2840.9	3.48	23	44.00	6.40	39.20	.	10.40	40.00	5	5	5	.	.	.	.	5	.	5.0	Poly
MDCB-056	5772.7	2.69	24	64.96	2.36	70.08	.	1.57	77.56	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-057	9227.2	2.96	30	60.34	6.40	66.75	.	9.11	61.58	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-058	8068.2	1.95	23	76.62	3.10	83.66	.	4.51	85.63	3	1	5	.	.	.	.	3	.	3.0	Poly
MDCB-059	8227.2	2.43	25	69.89	1.38	76.80	.	1.10	83.43	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-060	9431.8	2.64	31	66.27	9.16	69.16	.	10.84	65.78	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-061	7659.1	2.93	30	61.42	2.37	68.84	.	2.08	69.14	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-062	7727.2	2.55	27	67.06	1.47	82.06	.	2.35	77.94	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-063	9204.5	2.63	32	67.16	5.19	76.30	.	4.69	77.53	1	3	5	.	.	.	.	3	.	3.0	Poly
MDCB-064	9954.5	2.29	28	71.46	2.51	80.59	.	4.57	78.08	1	3	5	.	.	.	.	3	.	3.0	Poly

Table 2. (Continued)

Station	Abundance (#/m ²)	Shannon -Wiener	No. Taxa (#/ 0.044 m ²)	% Domi- nance	% Pollution Indicative	% Pollution Sensitive	% Tany/ Chiron	% Bivalve Abundance	% Deep Feeding	Abun- Score	Shan- Score	Taxa score	Domi- Score	Pollu- ind Score	Poll- sen Score	Tany Score	Bival- Score	Deep Score	MAIA Index	Salinity Class
MDCB-065	7818.2	2.81	31	70.06	5.23	57.27	.	3.49	49.71	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-066	4250.0	3.12	21	53.48	2.14	72.19	.	4.28	67.91	5	5	5	.	.	.	.	3	.	4.5	Poly
MDCB-067	8090.9	2.56	26	66.57	3.37	81.46	.	6.46	78.09	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-068	3772.7	3.70	28	43.37	12.05	55.42	.	13.25	45.78	5	5	5	.	.	.	.	5	.	5.0	Poly
MDCB-069	8886.3	2.75	27	63.17	2.56	78.26	.	6.39	73.91	1	3	5	.	.	.	.	3	.	3.0	Poly
MDCB-070	5977.3	2.52	24	70.34	1.90	74.14	.	1.14	80.99	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-071	7204.5	2.03	26	76.66	2.84	81.39	.	4.42	75.39	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-072	8522.7	3.21	28	54.93	12.27	61.07	.	15.20	65.07	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-073	5568.2	2.51	25	68.98	4.08	78.78	.	7.35	66.12	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-074	5863.6	1.87	21	77.91	0.39	81.01	.	0.78	87.60	3	1	5	.	.	.	.	3	.	3.0	Poly
MDCB-075	8590.9	3.21	27	56.88	4.50	75.40	.	6.61	67.20	3	5	5	.	.	.	.	3	.	4.0	Poly
MDCB-076	2409.1	2.82	13	55.66	33.96	14.15	.	4.72	15.09	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-077	7727.2	3.08	30	57.06	8.53	62.65	.	3.82	65.29	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-078	7545.4	3.70	29	40.66	12.05	60.24	.	18.98	40.36	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-079	8340.9	3.04	27	60.49	3.81	73.30	.	5.45	76.29	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-080	4863.6	3.04	21	52.80	18.69	35.51	.	1.40	34.58	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-081	10250.0	2.54	31	67.85	3.99	76.72	.	8.43	68.96	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-082	15318.1	2.12	31	75.52	4.60	80.56	.	8.01	76.56	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-083	11045.4	3.04	28	59.26	1.23	29.01	.	1.44	28.40	1	3	5	.	.	.	.	3	.	3.0	Poly
MDCB-084	11931.8	2.29	29	72.38	3.62	82.29	.	11.05	70.67	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-085	7522.7	3.53	28	44.71	6.65	30.82	.	10.57	25.98	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-086	6431.8	2.70	32	69.96	3.53	70.32	.	6.01	78.45	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-087	7159.1	3.29	30	53.97	5.71	68.25	.	8.89	64.44	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-088	954.5	3.07	12	47.62	23.81	11.90	.	33.33	2.38	3	3	3	.	.	.	.	5	.	3.5	Poly
MDCB-089	13704.5	3.53	36	43.12	0.50	23.71	.	0.17	43.78	1	5	5	.	.	.	.	1	.	3.0	Poly
MDCB-090	9250.0	2.39	32	71.01	2.70	84.52	.	9.09	71.50	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-091	2931.8	2.81	18	59.69	6.98	68.22	.	24.03	50.39	5	3	3	.	.	.	.	5	.	4.0	Poly
MDCB-092	9681.8	2.21	29	73.71	0.47	82.39	.	1.88	84.04	1	3	5	.	.	.	.	3	.	3.0	Poly
MDCB-093	11227.2	2.75	29	65.18	4.86	67.21	.	7.89	64.17	1	3	5	.	.	.	.	5	.	3.5	Poly
MDCB-094	9590.9	3.37	34	55.21	8.77	63.03	.	13.03	56.87	1	5	5	.	.	.	.	5	.	4.0	Poly
MDCB-095	4545.4	2.44	26	70.00	1.50	71.00	.	3.50	75.00	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-096	10386.3	1.92	28	80.31	1.97	92.34	.	10.07	78.77	1	1	5	.	.	.	.	5	.	3.0	Poly
MDCB-097	5840.9	1.75	24	81.32	3.89	85.21	.	3.50	77.43	3	1	5	.	.	.	.	3	.	3.0	Poly

Table 2. (Continued)

Station	Abundance (#/m ²)	Shannon -Wiener	No. Taxa (#/0.044 m ²)	% Dominance	% Pollution Indicative	% Pollution Sensitive	% Tany/Chiron	% Bivalve Abundance	% Deep Feeding	Abun Score	Shan Score	Taxa score	Domi Score	Pollu-ind Score	Poll-sen Score	Tany Score	Bival Score	Deep Score	MAIA Index	Salinity Class
MDCB-098	7477.2	2.20	27	72.64	1.52	85.11	.	3.65	77.20	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-099	11136.3	2.85	28	64.69	5.71	57.14	.	0.20	59.18	1	3	5	.	.	.	.	1	.	2.5	Poly
MDCB-100	6977.3	1.98	21	78.83	1.95	78.50	.	3.26	69.06	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-101	36840.8	2.67	33	64.03	4.63	19.00	.	0.19	66.69	1	3	5	.	.	.	.	1	.	2.5	Poly
MDCB-102	6181.8	3.69	36	47.79	4.04	65.81	.	14.71	52.21	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-103	5454.5	2.72	26	66.25	1.67	84.58	.	6.67	74.17	5	3	5	.	.	.	.	3	.	4.0	Poly
MDCB-104	9590.9	3.08	25	52.13	2.37	10.43	.	0.00	53.08	1	3	5	.	.	.	.	1	.	2.5	Poly
MDCB-105	6250.0	1.69	20	82.91	0.36	88.00	.	1.82	90.91	3	1	5	.	.	.	.	3	.	3.0	Poly
MDCB-106	3590.9	3.10	19	56.33	4.43	37.34	.	28.48	37.34	5	5	3	.	.	.	.	5	.	4.5	Poly
MDCB-107	6590.9	2.92	28	61.03	4.83	78.62	.	16.90	55.17	3	3	5	.	.	.	.	5	.	4.0	Poly
MDCB-108	7409.1	2.49	36	73.93	1.23	69.63	.	2.45	67.48	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-109	5227.3	2.15	14	70.43	3.04	73.48	.	3.48	54.35	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-110	11500.0	1.44	21	86.17	0.79	92.29	.	2.17	87.94	1	1	5	.	.	.	.	3	.	2.5	Poly
MDCB-111	7681.8	2.72	24	68.64	2.96	57.69	.	3.25	57.99	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-112	6750.0	2.74	24	63.97	0.34	82.15	.	5.39	69.02	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-113	6068.2	2.68	24	64.42	2.62	70.79	.	1.87	70.41	3	3	5	.	.	.	.	3	.	3.5	Poly
MDCB-114	8477.2	2.87	19	57.91	0.00	63.81	.	7.77	65.15	3	3	3	.	.	.	.	5	.	3.5	Poly
MDCB-115	5659.1	2.95	18	52.61	0.40	54.22	.	0.80	57.03	5	3	3	.	.	.	.	3	.	3.5	Poly
MDCB-116	37386.2	2.78	31	57.81	3.34	5.11	.	0.00	45.11	1	3	5	.	.	.	.	1	.	2.5	Poly
MDCB-117	26090.8	2.88	33	60.80	0.26	2.26	.	0.00	46.78	1	3	5	.	.	.	.	1	.	2.5	Poly
MDCB-118	5568.2	3.68	35	48.16	10.20	45.31	.	3.27	51.02	5	5	5	.	.	.	.	3	.	4.5	Poly
MDCB-119	6250.0	3.91	32	36.00	2.18	41.82	.	21.45	38.91	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-120	4818.2	3.78	30	39.15	30.66	19.34	.	16.51	11.32	5	5	5	.	.	.	.	5	.	5.0	Poly
MDCB-121	4295.4	3.18	21	52.38	26.98	28.04	.	13.23	17.99	5	5	5	.	.	.	.	5	.	5.0	Poly
MDCB-122	1659.1	2.08	11	76.71	58.90	24.66	.	23.29	4.11	5	3	3	.	.	.	.	5	.	4.0	Poly
MDCB-123	6000.0	3.30	26	53.03	17.80	53.79	.	11.74	46.59	3	5	5	.	.	.	.	5	.	4.5	Poly
MDCB-124	2363.6	2.36	14	70.19	3.85	6.73	.	0.00	12.50	5	3	3	.	.	.	.	1	.	3.0	Poly

Table 3. Site specific water quality measurements and sediment composition

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-001	506	08/02/02	12:35	60.18	0.5	30.41	7.99	4.67	31.25
					1.5	30.24	7.96	4.43	31.25
MDCB-002	505	08/02/02	12:15	65.58	0.5	29.80	7.93	4.54	30.92
					1.6	29.77	7.92	4.56	30.93
MDCB-003	603	08/02/02	11:51	54.80	0.5	29.61	7.92	4.66	30.84
					1.7	29.41	7.88	4.64	30.95
MDCB-004	553	08/02/02	12:58	3.96	0.5	30.14	7.96	4.78	31.43
					1.1	30.10	7.95	4.86	31.45
MDCB-005	507	08/02/02	11:21	19.70	0.5	30.14	7.94	5.23	32.29
					0.9	29.95	7.92	5.15	32.27
MDCB-006	604	08/02/02	13:31	76.10	0.5	30.24	7.84	4.54	31.68
					1.4	29.88	7.80	4.31	31.66
MDCB-007	616	08/01/02	13:17	63.89	0.5	31.71	8.00	6.32	28.52
MDCB-008	549	08/02/02	14:03	3.35	0.5	30.69	8.01	5.22	32.21
					0.7	30.68	8.01	5.30	32.21
MDCB-009	706	08/01/02	12:47	63.99	0.5	30.24	8.01	5.18	29.69
					0.7	30.21	8.01	5.64	29.70
MDCB-010	550	08/02/02	10:51	11.42	0.5	29.35	7.91	5.08	32.22
					1.0	28.95	7.88	5.11	32.18
MDCB-011	221	08/01/02	12:19	60.16	0.5	29.94	7.98	5.07	29.96
					1.0	29.89	7.97	5.12	29.97
MDCB-012	219	08/01/02	8:03	74.03	0.5	28.80	7.88	5.44	30.35
					1.1	28.80	7.88	5.48	30.35
MDCB-013	217	07/31/02	16:17	80.09	0.5	29.85	8.01	6.78	30.98
					1.3	29.86	8.02	8.08	30.97
MDCB-014	223	08/01/02	14:38	69.94	0.5	31.40	8.11	5.85	29.34
					0.9	31.40	8.12	6.05	29.36
MDCB-015	715	08/01/02	13:55	78.43	0.5	31.02	8.07	5.73	29.74
					1.0	30.96	8.07	6.01	29.74
MDCB-016	224	08/01/02	14:15	66.11	0.5	31.86	8.06	5.37	28.82
					0.8	29.55	7.92	5.07	29.27
MDCB-017	503	08/02/02	10:21	73.51	0.5	29.06	7.82	5.44	32.14
					2.4	28.73	7.79	5.28	32.16
MDCB-018	215	08/01/02	9:00	86.55	0.5	28.37	7.85	5.02	30.97
					1.1	27.66	7.63	4.18	31.33
MDCB-019	VA92-495	08/02/02	9:56	62.16	0.5	29.23	7.84	5.58	32.13
					2.2	28.75	7.81	5.45	32.10
MDCB-020	218	08/01/02	8:35	81.21	0.5	28.48	7.85	5.31	31.06
					1.3	28.34	7.83	5.42	31.07
MDCB-021	216	08/01/02	9:50	85.68	0.5	28.83	7.89	5.32	31.16
					1.5	28.37	7.82	4.93	31.25
MDCB-022	228	08/01/02	9:28	66.43	0.5	28.58	7.81	4.83	31.12
					1.0	28.24	7.74	5.04	31.14

Table 3. (Continued)

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-023	211	08/02/02	8:16	22.52	0.5	28.86	7.74	5.31	31.86
					1.1	28.84	7.74	5.69	31.86
MDCB-024	212	08/02/02	7:58	70.72	0.5	29.19	7.76	5.68	31.85
					1.5	29.17	7.75	5.64	31.85
MDCB-025	202	08/01/02	10:17	90.83	0.5	28.73	7.85	5.03	31.32
					1.5	28.24	7.75	4.75	31.36
MDCB-026	203	08/01/02	10:37	93.08	0.5	28.82	7.87	5.01	31.47
					1.6	28.31	7.76	4.70	31.56
MDCB-027	213	08/02/02	8:41	86.78	0.5	29.08	7.81	5.57	31.88
					1.7	29.04	7.80	5.72	31.88
MDCB-028	628	08/02/02	14:31	7.42	0.5	30.61	7.88	4.87	31.47
					0.6	30.59	7.88	4.93	31.46
MDCB-029	205	08/05/02	8:11	22.55	0.5	28.98	7.63	4.87	31.71
					0.9	28.97	7.63	4.93	31.71
MDCB-030	227	08/05/02	8:50	26.19	0.5	28.88	7.76	5.45	32.34
					1.3	28.88	7.77	5.62	32.34
MDCB-031	204	08/05/02	8:33	93.01	0.5	29.09	7.74	5.42	32.12
					1.7	29.07	7.73	5.68	32.15
MDCB-032	214	08/05/02	9:13	3.99	0.5	28.60	7.80	5.46	32.59
					0.7	28.60	7.81	5.52	32.59
MDCB-033	504	08/05/02	9:32	3.35	0.5	28.38	7.86	5.50	31.82
					0.9	28.38	7.86	5.72	31.82
MDCB-034	206	08/05/02	10:09	87.68	0.5	29.31	7.75	4.99	32.08
					1.3	29.25	7.74	5.04	32.08
MDCB-035	226	08/02/02	9:23	88.38	0.5	29.80	7.86	5.84	31.86
					3.0	28.79	7.65	4.61	31.81
MDCB-036	210	08/14/02	14:18	88.33	0.5	32.58	8.01	6.66	33.78
MDCB-037	207	08/05/02	10:28	61.38	0.5	29.32	7.77	5.11	31.99
					1.5	29.22	7.75	5.17	32.00
MDCB-038	620	08/05/02	14:27	74.82	0.5	31.44	7.90	5.37	32.34
					1.4	30.28	7.72	4.66	32.29
MDCB-039	201	08/05/02	10:50	11.25	0.5	29.48	7.80	5.12	32.15
					0.7	29.50	7.81	5.16	32.16
MDCB-040	501	08/05/02	11:57	19.01	0.5	29.51	7.82	5.05	32.10
					1.5	29.48	7.81	5.14	32.07
MDCB-041	502	08/05/02	11:19	80.03	0.5	30.40	7.70	4.62	32.21
MDCB-042	623	08/05/02	13:22	10.56	0.5	31.12	7.87	5.43	31.85
MDCB-043	VA93-641	08/06/02	8:27	3.01	0.5	23.98	7.52	5.51	31.84
					2.3	24.01	7.54	5.66	31.98
MDCB-044	508	08/06/02	8:49	5.06	0.5	28.06	7.77	4.62	34.78
					0.8	28.07	7.77	4.66	34.77
MDCB-045	707	08/14/02	10:09	50.74	0.5	28.45	8.53	6.42	25.92
					0.7	28.40	8.50	6.55	25.94

Table 3. (Continued)

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-046	614	08/06/02	9:21	87.43	0.5	28.96	7.70	4.28	33.67
					1.5	28.80	7.68	3.95	34.35
MDCB-047	315	08/14/02	11:16	61.47	0.3	31.62	8.45	7.66	20.40
MDCB-048	301	08/14/02	9:27	77.39	0.5	27.02	7.82	5.16	34.71
					0.8	27.01	7.83	5.49	34.71
MDCB-049	313	08/14/02	8:54	80.56	0.5	27.25	7.85	5.01	34.99
					0.8	27.09	7.82	4.90	35.01
MDCB-050	314	08/06/02	12:18	90.76	0.5	28.34	7.84	4.87	33.24
					0.7	28.34	7.84	4.91	33.31
MDCB-051	316	08/06/02	12:52	10.38	0.5	29.22	7.90	6.01	33.51
MDCB-052	306	08/06/02	13:24	95.06	0.5	28.76	7.92	5.31	34.35
					1.4	28.76	7.93	5.67	34.34
MDCB-053	305	08/06/02	14:32	13.16	0.5	28.41	7.91	5.57	34.18
					0.6	28.39	7.91	6.24	34.19
MDCB-054	509	08/06/02	10:00	22.35	0.5	27.75	7.92	5.66	35.04
MDCB-055	611	08/06/02	11:00	17.72	0.5	28.50	7.80	4.72	34.58
					1.0	28.46	7.81	5.31	34.58
MDCB-056	303	08/06/02	14:06	92.22	0.5	28.72	7.93	5.23	34.52
					1.5	28.70	7.93	5.37	34.52
MDCB-057	304	08/06/02	13:47	23.04	0.5	28.96	7.91	5.36	34.21
					1.0	28.95	7.91	5.82	34.21
MDCB-058	317	08/06/02	14:55	87.55	0.5	28.65	7.96	5.64	34.65
					1.3	28.64	7.96	5.82	34.65
MDCB-059	312	08/09/02	8:46	92.57	0.5	24.90	7.87	5.18	34.58
					1.6	24.73	7.82	4.94	34.56
MDCB-060	307	08/09/02	8:30	13.85	0.5	24.83	7.89	5.55	34.75
					1.1	24.74	7.88	5.55	34.75
MDCB-061	309	08/09/02	8:42	83.38	0.5	24.99	7.85	5.16	34.58
					1.5	24.87	7.83	5.05	34.57
MDCB-062	308	08/09/02	8:26	75.98	0.5	25.27	7.88	5.66	34.89
					1.9	25.22	7.87	5.67	34.89
MDCB-063	310	08/09/02	8:37	70.89	0.5	25.01	7.84	5.31	34.60
					1.9	24.99	7.82	5.23	34.62
MDCB-064	318	08/09/02	8:22	73.42	0.5	25.17	7.90	5.74	34.82
					1.9	25.15	7.88	5.73	34.83
MDCB-065	521	08/06/02	10:36	17.52	0.5	28.06	7.99	5.17	35.26
					1.4	28.06	8.01	5.18	35.31
MDCB-066	311	08/09/02	8:54	69.74	0.5	25.00	7.83	4.85	34.59
					1.9	24.82	7.79	4.75	34.59
MDCB-067	322	08/09/02	8:51	70.76	0.5	24.87	7.82	4.98	34.59
					1.7	24.72	7.78	4.76	34.58
MDCB-068	319	08/09/02	8:12	30.49	0.5	25.09	7.87	6.01	34.88
					1.0	25.09	7.86	6.03	34.87

Table 3. (Continued)

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-069	323	08/09/02	8:59	38.26	0.5	25.05	7.83	4.98	34.64
					1.8	24.88	7.79	4.77	34.66
MDCB-070	324	08/09/02	9:03	90.84	0.5	24.79	7.81	4.65	34.65
					1.4	24.62	7.79	4.60	34.65
MDCB-071	320	08/09/02	8:18	9.50	0.5	25.06	7.89	5.77	34.92
					1.3	25.04	7.88	5.76	34.92
MDCB-072	325	08/09/02	9:13	50.53	0.5	25.19	7.85	4.69	34.78
					2.0	24.94	7.82	4.52	34.77
MDCB-073	522	08/06/02	11:28	16.87	0.5	28.28	8.02	5.23	35.52
					1.5	28.27	8.02	5.71	35.52
MDCB-074	321	08/09/02	9:09	67.90	0.5	25.11	7.80	4.61	34.64
					1.9	24.92	7.77	4.45	34.62
MDCB-075	524	08/09/02	9:18	36.93	0.5	25.18	7.89	4.71	34.83
					2.0	24.99	7.88	4.60	34.95
MDCB-076	526	08/15/02	6:24	3.70	0.5	26.55	8.19	5.69	38.87
MDCB-077	523	08/12/02	10:02	7.37	0.5	25.32	8.08	5.25	37.73
					1.1	25.23	8.09	4.99	37.89
MDCB-078	525	08/09/02	9:32	20.44	0.5	25.09	7.84	5.13	34.56
					1.6	24.93	7.83	5.05	34.56
MDCB-079	513	08/09/02	9:47	52.73	0.5	25.32	7.86	4.78	34.69
					1.8	25.06	7.74	4.61	34.75
MDCB-080	527	08/15/02	7:33	5.84	0.5	25.64	8.01	5.54	37.73
					0.8	25.64	8.01	5.75	37.72
MDCB-081	515	08/12/02	8:47	18.27	0.5	25.08	7.85	5.96	35.40
					1.5	25.08	7.85	6.00	35.40
MDCB-082	517	08/12/02	9:00	17.62	0.5	25.27	7.85	6.07	35.22
					1.6	25.27	7.85	6.16	35.22
MDCB-083	516	08/12/02	9:22	1.52	0.5	25.81	7.99	5.71	35.74
					0.8	25.81	7.99	5.76	35.74
MDCB-084	510	08/12/02	10:46	28.86	0.5	25.77	7.97	5.69	35.80
					2.2	25.56	7.95	5.73	35.79
MDCB-085	514	08/09/02	10:19	3.94	0.5	25.49	7.85	5.84	34.90
					1.5	25.16	7.81	5.54	34.91
MDCB-086	VA93-634	08/09/02	14:59	69.38	0.5	26.47	7.92	6.32	35.14
					2.3	26.32	7.90	6.05	35.16
MDCB-087	512	08/09/02	14:35	69.17	0.5	26.29	7.87	5.86	35.14
					2.3	26.16	7.85	5.82	35.13
MDCB-088	551	08/09/02	10:50	3.78	0.5	25.14	7.84	5.91	35.10
					1.0	24.96	7.85	6.06	35.12
MDCB-089	714	08/09/02	13:46	9.15	0.5	26.31	8.15	6.40	36.28
					0.9	26.25	8.15	6.48	36.30
MDCB-090	708	08/09/02	14:09	9.55	0.5	26.17	7.91	5.76	35.25
					1.9	25.55	7.86	4.99	35.45

Table 3. (Continued)

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-091	541	08/09/02	11:20	4.08	0.5 0.7	25.50 25.48	7.81 7.81	5.62 5.71	35.90 35.89
MDCB-092	537	08/09/02	11:50	86.16	0.5 2.3	25.99 25.79	7.81 7.79	5.32 5.29	36.03 36.04
MDCB-093	554	08/09/02	12:33	36.30	0.5 2.4	25.97 25.39	7.85 7.82	5.44 5.21	35.71 35.71
MDCB-094	536	08/09/02	12:12	54.80	0.5 2.4	25.85 25.41	7.87 7.83	5.54 5.39	35.70 35.69
MDCB-095	555	08/09/02	12:57	4.55	0.5 2.0	25.84 25.58	8.03 8.03	5.93 5.99	35.94 35.96
MDCB-096	712	08/12/02	11:19	79.12	0.5 1.8	26.18 26.06	7.80 7.80	5.75 5.85	36.29 36.28
MDCB-097	520	08/12/02	12:13	6.71	0.5 0.9	26.86 26.85	8.06 8.12	5.74 5.85	36.85 37.08
MDCB-098	543	08/13/02	14:33	81.21	0.5 1.0	28.18 28.15	7.93 7.93	5.89 6.02	36.92 36.92
MDCB-099	709	08/12/02	12:35	11.28	0.5 1.3	26.96 25.82	8.16 8.13	5.69 5.67	37.86 38.14
MDCB-100	531	08/12/02	11:46	4.84	0.5 1.4	26.51 26.06	7.96 8.16	5.77 5.87	36.54 37.17
MDCB-101	545	08/13/02	15:02	14.26	0.5 0.6	29.25 29.20	7.97 7.97	6.04 6.19	37.26 37.24
MDCB-102	VA90-034	08/12/02	13:48	46.28	0.5 2.3	26.69 26.61	7.88 7.88	5.55 5.65	36.23 36.23
MDCB-103	533	08/12/02	14:11	53.10	0.5 2.4	26.95 26.80	7.87 7.87	5.38 5.47	35.98 36.00
MDCB-104	532	08/12/02	13:10	93.06	0.5	27.20	8.05	6.04	36.59
MDCB-105	711	08/13/02	14:04	76.19	0.5 1.6	27.86 27.77	7.94 7.94	5.89 5.97	36.41 36.41
MDCB-106	548	08/13/02	15:39	3.64	0.5 0.6	29.67 29.60	8.04 8.05	6.78 6.84	37.13 37.14
MDCB-107	538	08/13/02	13:38	24.11	0.5 2.0	27.68 26.96	8.00 7.99	5.95 5.98	35.66 35.89
MDCB-108	530	08/13/02	13:18	6.44	0.5 1.8	28.17 27.86	8.26 8.25	6.41 6.38	36.80 36.84
MDCB-109	713	08/13/02	13:06	7.37	0.5 1.8	27.90 27.15	8.11 8.10	6.13 6.15	35.95 36.04
MDCB-110	540	08/13/02	10:30	63.58	0.5 2.0	26.81 26.56	7.94 7.93	5.99 5.97	35.52 35.51
MDCB-111	547	08/13/02	8:57	95.82	0.5 1.0	26.51 26.50	7.76 7.75	5.71 5.72	35.11 35.12
MDCB-112	552	08/13/02	9:59	54.11	0.5 1.9	26.41 26.34	7.90 7.90	6.19 6.29	34.97 34.97

Table 3. (Continued)

Station	DNR Station	Sampling		Silt-Clay (%)	Depth (m)	Temp (°C)	pH	DO Conc (mg/L)	Salinity (psu)
		Date	Time (hh:mm)						
MDCB-113	710	08/13/02	9:30	80.48	0.5	26.47	7.82	6.17	34.51
					1.9	26.44	7.83	6.34	34.51
MDCB-114	MAIA-09	08/08/02	15:40	55.43	0.5	26.49	7.76	6.04	34.58
					1.0	26.48	7.76	6.19	34.58
MDCB-115	MAIA-10	08/08/02	15:08	83.94	0.5	26.27	7.72	6.10	33.69
					1.0	26.26	7.73	6.22	33.69
MDCB-116	MAIA-08	08/13/02	11:29	52.30	0.5	27.72	7.98	6.46	35.08
					0.6	27.65	7.98	6.53	35.12
MDCB-117	MAIA-52	08/13/02	12:12	49.10	0.5	27.98	7.87	7.30	33.35
					0.6	27.96	7.87	7.28	33.35
MDCB-118	MAIA-49	08/08/02	13:20	14.99	0.5	25.39	7.57	5.76	32.32
					0.5	25.71	7.72	6.05	32.64
MDCB-119	MAIA-11	08/08/02	13:51	3.45	0.8	25.70	7.73	6.13	32.63
MDCB-120	MAIA-12	08/08/02	10:54	3.29	0.5	24.32	7.55	5.56	32.35
					1.6	24.23	7.56	5.98	32.32
MDCB-121	MAIA-51	08/08/02	12:50	4.10	0.5	24.92	7.64	6.57	32.36
MDCB-122	MAIA-13	08/08/02	10:01	3.01	0.5	24.60	7.64	6.06	32.34
					0.8	24.54	7.64	6.38	32.34
MDCB-123	MAIA-50	08/08/02	9:35	11.20	0.5	23.79	7.57	6.11	32.10
					1.1	23.77	7.58	6.16	32.10
MDCB-124	MAIA-48	08/08/02	11:59	50.86	0.5	25.04	7.55	5.68	32.90
					0.8	25.03	7.54	6.05	32.89

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